

## YOSHIMURA, GWEN

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**From:** Andrea Polidori <[apolidori@aqmd.gov](mailto:apolidori@aqmd.gov)>  
**Sent:** Wednesday, July 09, 2014 10:20 AM  
**To:** Flagg, MichaelA; YOSHIMURA, GWEN  
**Subject:** RE: 2013 TSA report - Findings and Corrective Action Table  
**Attachments:** 20140418\_SouthCoastAQMD\_DraftTSAreport\_SCAQMD.docx

Michael and Gwen,

I have added a few minor factual edits to your draft document, and a series of comments to the main "FINDINGS" section. I hope you will consider these comments and modify/update some of your findings accordingly. Let me know if you would like me to call you to discuss.

Once the report is final, we would need a formal corrective action plan, which consists of "findings forms" and a matrix like the one you have provided.

This should not take long.

We can talk in further detail if needed, as the process/format of the corrective action plan has changed since the last TSA.

That would be great. Please let me know when you are available.

Thanks!

Andrea

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**From:** Flagg, MichaelA [<mailto:Flagg.MichaelA@epa.gov>]  
**Sent:** Wednesday, July 02, 2014 11:10 AM  
**To:** YOSHIMURA, GWEN; Andrea Polidori  
**Cc:** Plate, Mathew; Rudy Eden; Jason Low; Mike Hamdan; Kathy Kasza; Laki Tisopulos  
**Subject:** RE: 2013 TSA report - Findings and Corrective Action Table

Thanks Andrea! As Gwen mentioned below, please let me know if you have any factual edits to the document itself. If not, we can add language to the findings that you have made progress on and finalize the report.

Once the report is final, we would need a formal corrective action plan, which consists of "findings forms" and a matrix like the one you have provided.

We can talk in further detail if needed, as the process/format of the corrective action plan has changed since the last TSA.

Michael Flagg  
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**From:** YOSHIMURA, GWEN

**Sent:** Wednesday, July 02, 2014 8:44 AM

**To:** [apolidori@aqmd.gov](mailto:apolidori@aqmd.gov); Flagg, MichaelA

**Cc:** Plate, Mathew; Rudy Eden; [JLow@aqmd.gov](mailto:JLow@aqmd.gov); [mhamdan@aqmd.gov](mailto:mhamdan@aqmd.gov); Kathy Kasza; Laki Tisopulos

**Subject:** RE: 2013 TSA report - Findings and Corrective Action Table

Hi Andrea,

Thanks! I'm sure Michael will take a closer look at these – I just wanted to do a quick check on the administrative side: we sent you the draft report to check for any factual corrections to the text. Did you have any? We do not typically receive corrective actions prior to the report going final, but we are pleased to see you already have a number of issues taken care of/solutions in the works, and can make a statement in the report that we are aware that SCAQMD has already taken steps to address a number of the findings.

After we get word back we will finalize the report.

Thanks,  
Gwen

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**From:** Andrea Polidori [<mailto:apolidori@aqmd.gov>]

**Sent:** Wednesday, July 02, 2014 8:34 AM

**To:** Flagg, MichaelA

**Cc:** YOSHIMURA, GWEN; Plate, Mathew; Rudy Eden; [JLow@aqmd.gov](mailto:JLow@aqmd.gov); [mhamdan@aqmd.gov](mailto:mhamdan@aqmd.gov); Kathy Kasza; Laki Tisopulos

**Subject:** 2013 TSA report - Findings and Corrective Action Table

Good morning Michael,

Attached you will find a Table summarizing our comments to the TSA draft report. As you will see, actions to address some of EPA's findings have already been taken and/or are underway. Please let me know if you would like to discuss any aspects of this document by phone (909-396-3283).

Best Regards,

Andrea

*Andrea Polidori, Ph.D*  
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**Technical System Audit  
South Coast Air Quality Management District  
Ambient Air Monitoring Program  
September 24-25, 2013**

**Conducted by**

**Air Quality Analysis Office  
Air Division**

**Quality Assurance Office  
Management and Technical  
Services Division**

**US EPA Region 9  
75 Hawthorne Street  
San Francisco, California 94105**

**Draft Report: April 18, 2014**

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**GLOSSARY OF ACRONYMS**

AQAO.....	Air Quality Analysis Office
AQIS.....	Air Quality Instrument Specialist
AQS.....	Air Quality System
BAM.....	Beta Attenuation Monitor
CA.....	California
CARB.....	California Air Resources Board
CO.....	Carbon Monoxide
CFR.....	Code of Federal Regulations
DQO.....	Data Quality Objective
EMS.....	Electronic Management System
EPA.....	Environmental Protection Agency
FEM.....	Federal Equivalent Method
FID.....	Flame Ionization Detector
FRM.....	Federal Reference Method
GC.....	Gas Chromatograph (Gas Chromatography)
ICP-MS.....	Inductively Coupled Plasma- Mass Spectroscopy
IO.....	Inorganic Compendium
LTE.....	less than or equal to
MATES.....	Multiple Air Toxics Exposure Study
MDL.....	Method Detection Limit
MS.....	Mass Spectrometer
MSD.....	Mass Selective Detector
NAAQS.....	National Ambient Air Quality Standard
NATTS.....	National Air Toxics Trends Stations
NCORE.....	National Core multipollutant monitoring stations
NIST.....	National Institute for Standards and Technology
NO <sub>x</sub> /NO <sub>y</sub> .....	Nitrogen Oxides
O <sub>3</sub> .....	Ozone
ORD.....	Office of Research and Development
PAMS.....	Photochemical Assessment Monitoring Stations
Pb.....	Lead
PE.....	Performance Evaluation
PM.....	Particulate Matter
PM <sub>2.5</sub> .....	Particulate Matter with aerodynamic diameter LTE 2.5 µm
PM <sub>10</sub> .....	Particulate Matter with aerodynamic diameter LTE 10 µm
POC.....	Parameter Occurrence Code
PQAO.....	Primary Quality Assurance Organization
QA.....	Quality Assurance
QAPP.....	Quality Assurance Project Plan
QAO.....	Quality Assurance Office
QC.....	Quality Control
QMP.....	Quality Management Plan
RTI.....	Research Triangle Institute (EPA Contractor)
SCAQMD.....	South Coast Air Quality Management District
SLAMS.....	State or Local Air Monitoring Station
SOP.....	Standard Operating Procedure
SO <sub>2</sub> .....	Sulfur Dioxide

SPM.....	Special Purpose Monitor
SRP.....	Standard Reference Photometer
STN.....	Speciation Trends Network
STP.....	Standard Temperature and Pressure
TAD .....	Technical Assistance Document
TEOM.....	Tapered Element Oscillating Microbalance
TO .....	Toxic Organic Compendium
TSA.....	Technical System Audit
TSP.....	Total Suspended Particles
XRF .....	X-ray Fluorescence

## EXECUTIVE SUMMARY

This document is a report on the findings of the United States Environmental Protection Agency (EPA) made during a Technical Systems Audit (TSA) of the South Coast Air Quality Management District (SCAQMD) ambient air monitoring program. A TSA is an on-site review and inspection of a state or local ambient air monitoring program to assess its compliance with established regulations governing the collection, analysis, validation, and reporting of ambient air quality data. This TSA meets the requirements for EPA audits of the SCAQMD monitoring organization required by 40 CFR 58, appendix A, §2.5.

The TSA was conducted by EPA Region 9 staff from September 24-25, 2013. The audit team interviewed management and staff on specific aspects of the air monitoring program including network design, field operations, laboratory operations, data handling, quality assurance and quality control procedures. The audit team also inspected two of the monitoring sites and three prospective SLAMS near-roadway sites operated by SCAQMD. The site inspections consisted of an interview with the site operator when possible, review of station and instrument logbooks, and evaluation of the station siting with respect to EPA requirements for probe siting (40 CFR 58, Appendix E). The laboratory inspection included a limited review of the particulate matter (PM) program for mass determinations of PM<sub>10</sub> and PM<sub>2.5</sub> and Pb-TSP analysis. As this TSA was completed in two days, it was focused in scope while still exceeding the TSA requirements in 40 CFR 58 Appendix A. As timing, resources, and needs dictate, EPA will tailor the scope and duration of TSAs accordingly.

The TSA is one of the ways that EPA provides oversight to ensure that data collected by state, local, and tribal agencies meet required minimum data quality objectives. Other assessments, such as network reviews and performance evaluations, also provide information about the overall quality of ambient air monitoring data. These assessments enable agencies to identify and correct those program elements that may be adversely affecting the quality of ambient air data. The results of the TSA are summarized here and fully described in this report, along with recommended actions to address the findings. The specific actions to be taken by SCAQMD will be determined through negotiations between EPA and SCAQMD, and will be documented in a corrective action plan prepared by SCAQMD.

EPA would like to thank all the staff and management of SCAQMD for their assistance and cooperation during the audit.

### A. Program Strengths:

SCAQMD management and staff are extremely knowledgeable. They are working on systems to address the highest priority issues first, and have improved communication and collaboration between Quality Assurance, Atmospheric Measurements, and the Laboratory management and staff. SCAQMD demonstrates an overall, collective understanding of how individual responsibilities fit together to produce defensible, quality data, which is resulting in better recognition of significant issues and stronger QA across the board.

### B. Program Major Findings:

During the TSA, EPA identified areas where SCAQMD's monitoring program should be strengthened. The major findings are:

- SCAQMD is not evaluating or implementing potential short-term fixes for existing siting issues.
- SCAQMD continues to face challenges covering all activities associated with producing quality data due to staff turnover, unfilled positions and increased responsibilities.
- The SCAQMD PAMS program lacks a QAPP and definitive programmatic direction.
- The QA program oversight of all data-related activities is too narrow and not applied consistently. Overall documentation procedures are not completely articulated and SCAQMD lacks a process for updating and implementing SOPs.

**Commented [a1]:** This part should reflect the final changes in the main "FINDINGS" section



It has been EPA Region 9's experience that all monitoring programs have areas that could be improved. Unless otherwise noted, EPA's findings are not cause for data invalidation. As stated previously, SCAQMD has a robust air monitoring program that produces reliable, defensible, valid data for regulatory use.

## **TSA ACTIVITIES**

From September 24-25, 2013 the EPA Region 9 Air Quality Analysis Office (AQAO) and Quality Assurance Office (QAO) conducted a Technical System Audit of SCAQMD's ambient air monitoring program. The TSA reviews one part of SCAQMD's program responsibility, the collection and analysis of ambient air quality data, which is the responsibility of the Air Quality Assessment Section. The TSA covered the following program areas:

- General / Quality Management
  - Program organization
  - Facilities
  - Independent quality assurance and quality control
  - Planning documents (including QMP, QAPPs, & SOPs)
  - General documentation policies
  - Training
  - Corrective action
  - Quality improvement
  - External performance audits
- Network Management / Field Operations
  - Network design
  - Changes to the network since the last audit
  - Proposed changes to the network
  - Field support
- Laboratory Operations
  - Routine operations
  - Quality control
  - Laboratory preventive maintenance
  - Laboratory record keeping
  - Laboratory data acquisition and handling
  - Specific pollutants: PM<sub>10</sub>, PM<sub>2.5</sub>, Toxics, PAMS, and Lead
- Data and Data Management
  - Data handling
  - Software documentation
  - Data validation and correction
  - Data processing
  - Internal reporting
  - External reporting

EPA tracked supporting documentation for data points from calendar year 2012.

The EPA TSA was conducted by Gwen Yoshimura (AQAO) and Mathew Plate (QAO). Meredith Kurpius and Eugenia McNaughton, managers of the AQAO and QAO, respectively, participated in the opening and closing meetings.

Participating managers and supervisors of the SCAQMD Air Quality Assessment Section included Philip Fine, Rudy Eden, Jason Low, Andrea Polidori, Solomon Teffera, Steve Barbosa, and Rene Bermudez.

This report is divided into the following sections:

- Executive Summary – describes the purpose of the TSA and a summary of the major findings.
- TSA Activities – outlines the timing of this TSA and the programs that were covered.
- Overview of Air Monitoring Program – describes SCAQMD's Air Monitoring Program.

- Findings – collection of positive, major, minor findings, and recommendations that includes details associated with each finding.
- Appendix A – summarized list of findings with priority ranking.
- Appendix B – SCAQMD organizational chart.

The Findings section includes positive findings and those that require corrective action. They are grouped by program area. Recommendations to resolve findings are provided for each one that requires corrective action to give some indication of EPA expectation as to how they may be addressed. If SCAQMD has other approaches or alternatives to address the concerns identified, EPA will consider them, provided the corrective action adequately addresses the finding. Appendix A is a summarized list of findings excluding positive findings, listed according to priority. Higher priority findings are those that: (1) are over-arching issues, (2) have a greater impact on regulatory decisions, and/or (3) affect data quality. All findings should be addressed in a corrective action report.

### **General**

For this TSA, the audit team interviewed management and staff, focusing on specific aspects of the air monitoring program including network design, field operations, laboratory operations, data handling, quality assurance and quality control procedures. EPA interviewed management and staff from Atmospheric Measurements, including Operations, Support, Data Management, and Special Monitoring, as well as management and staff from the Quality Assurance Branch and the Laboratory, and reviewed SCAQMD's procedures, quality assurance documents, performed data tracking, and reviewed findings from the previous TSA conducted in 2010.

### **Network Management**

EPA interviewed SCAQMD, including Jason Low, Andrea Polidori, Rene Bermudez, and reviewed SCAQMD's July 2013 Annual Network Plan. SCAQMD also submitted a five-year Annual Network Assessment in July 2010 as required by 40 CFR part 58.10. The next network assessment will be due in 2015. Generally, the monitoring network meets the requirements for the minimum number of monitoring sites designated as SLAMS for all of the criteria pollutants.

### **Field Operations**

In addition to those individuals previously mentioned, EPA interviewed several Air Quality Monitoring Unit staff. All staff demonstrated a thorough knowledge of the operation of the monitoring equipment for which they were responsible.

EPA visited Crestline (AQS ID 06-071-0005), South Long Beach (06-037-4004), and the prospective new near roadway monitoring sites at Etiwanda off the I-10 West in the Riverside-San Bernardino-Ontario MSA, the prospective sites in Anaheim and off the I-710 E at Long Beach Boulevard in the Los Angeles-Long Beach-Santa Ana MSA. Most sites met the siting criteria of 40 CFR part 58, appendix E. The evaluation included inspection of the inlet manifolds, examination of station and instrument logbooks, and a check of whether appropriate QC checks and QA audits were being performed. See findings A1 and C2 for additional comments about monitor siting. EPA also notes that the Crestline and South Long Beach station operators maintained well-organized, clean station with high-quality documentation and tracking of typical site operations, issues and resolutions.

### **Laboratory Operations**

#### **Particulate Matter Laboratory (Gravimetric Laboratory)**

EPA visited the particulate matter (gravimetric) laboratory and interviewed Steve Taw and Solomon Teffera. SCAQMD recently lost the person whose responsibility it was to weigh the PM<sub>2.5</sub> filters. Current staff are quickly coming up to speed, however, it is difficult to trace certain void or QA qualifier codes entered earlier. This issue highlights the importance of clear procedures and documentation.

EPA also interviewed Yang Song and the interns responsible for filter processing, and Sandra Hom about Pb-TSP data processing. The Pb-TSP sample handling, processing and analysis was well run.

### **Data and Data Management**

This section covers data management for criteria pollutants (O<sub>3</sub>, CO, NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>2.5</sub>, PM<sub>10</sub>, and Pb). Brian Vlasich and Michael Hamdan were interviewed. SCAQMD collects a large amount of data each day. The data validators are doing an exceptional job of working to find areas where the process, including documentation, could be improved. The level of understanding of the entire system and ability to identify and investigate possible reasons for data issues is most impressive. While data tracking showed that improvements could be made, SCAQMD is doing well considering how few staff are performing data validation in relation to the large volume of data to be processed.

### **Quality Management**

EPA interviewed Andrea Polidori and Raul Dominguez and reviewed quality management documents. In addition, EPA collected information about QA/QC activities during interviews of other sections of the technical system.

OVERVIEW OF AIR MONITORING PROGRAM

General Program

Federal and California State laws require that clean air standards be met and maintained throughout the nation and the State of California. Authority and responsibility for air quality monitoring has been delegated to SCAQMD by the US EPA pursuant to the Clean Air Act of 1977 and the Clean Air Act Amendments of 1990. The SCAQMD is defined in the California Health and Safety Code, Division 26, Air Resources, Section 40412 as the “Sole and exclusive agent having responsibility for air pollution control within the District.” The State defines the geographic extent of the SCAQMD as “portions of Counties of Los Angeles, Orange, Riverside, and San Bernardino included within the area of the South Coast Air Basin, as described in Section 60104 of the Title 17 of the California Administrative Code.”

The SCAQMD currently has 40 active monitoring stations for criteria pollutants. The criteria pollutants measured include:

- Carbon Monoxide (CO)
- Nitrogen Dioxide (NO<sub>2</sub>)
- Sulfur Dioxide (SO<sub>2</sub>)
- Lead (Pb)
- Ozone (O<sub>3</sub>)
- Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>)

Barry Wallerstein is the SCAQMD’s Executive Officer. Matt Miyasato, Deputy Executive Officer, heads the Science & Technology Advancement Division. At the time of the TSA, Philip Fine was the Assistant Deputy Executive Officer, leading the Monitoring & Analysis sub-Division, which is the primary organization in Science & Technology Advancement responsible for air monitoring. The Monitoring & Analysis group has three functional areas (branches): Laboratory Services & Source Test Engineering (Rudy Eden, manager), Atmospheric Measurements (Jason Low, manager), and Quality Assurance (Andrea Polidori, manager).

Atmospheric Measurements (Monitoring), Laboratory Services & Source Test Engineering (Laboratory), and Quality Assurance (QA) each have a role in the collection and evaluation of ambient air data as defined by the SCAQMD Quality Management Plan (QMP). The Monitoring group is responsible for most of the ambient air data collection, including sampling and data processing of continuous air monitors. The Laboratory is responsible for preparation of sampling media, analysis of analytical samples from the non-continuous monitors, and processing of data from these samples. Both groups are responsible for implementing routine quality assurance and quality control (QA/QC) procedures. The QA group is responsible for tracking and oversight of training, corrective actions, and data handling. The QA group also implements performance and technical audits and coordinates and participates in the preparation of QA planning documents.

Network Management

The SCAQMD ambient air monitoring network currently consists of 40 State/Local Air Monitoring Stations (SLAMS) plus several source oriented lead monitors, special studies and Special Purpose Monitoring (SPM) sites that utilize a variety of air pollutant measuring instruments. The following table summarizes the SLAMS sites in the SCAQMD.

**Table 1: Air Monitoring Sites in the SCAQMD** (Source: SCAQMD 2013 Air Monitoring Network Plan)

Station	O <sub>3</sub>	CO	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>2.5</sub> FRM	PM <sub>10</sub> FRM	PM <sub>2.5</sub> Cont.	PM <sub>10</sub> Cont.	TSP
Anaheim	X	X		X	X	X	X	X	
ATSF (Exide)									X
Azusa	X	X		X	X	X			X
Banning	X			X		X	X		
Big Bear					X				
Burbank	X	X	X	X	X	X	X	X	
Closet World (Quemetco)									X
Compton	X	X		X	X				X
Costa Mesa	X	X	X	X					
Crestline	X					X	X		
Fontana	X	X	X	X	X	X			X
Glendora	X	X		X			X	X	
Indio	X				X	X		X	
La Habra	X	X		X					
Lake Elsinore	X	X		X			X	X	
LAXH	X	X	X	X		X			X
Long Beach (North)	X	X	X	X	X	X	X	X	X
Long Beach (Hudson)									
Los Angeles	X	X	X	X	X	X	X	X	X
Mira Loma (Van Buren)	X	X		X	X	X	X	X	
Mission Viejo	X	X			X	X			
Norco						X			
Ontario F.S.					X	X			
Palm Springs	X	X		X	X	X		X	
Pasadena	X	X		X	X				X
Perris	X					X			
Pico Rivera	X	X		X	X				X
Pomona	X	X		X					
Redlands	X					X			
Rehrig (Exide)									X
Reseda	X	X		X	X		X		
Riverside-Magnolia		X		X	X		X	X	X
Rubidoux	X	X	X	X	X	X	X	X	X
San Bernardino	X	X		X	X	X		X	X
Santa Clarita	X	X		X		X	X		
So. Long Beach					X	X	X		X
Temecula							X		
Uddelholm (Trojan)									X
Upland	X	X		X			X	X	X
West L.A.	X	X		X					X

SCAQMD also operates several sites for the following SPM projects and source-oriented lead sampling:

- Multiple Air Toxics Exposure Study (MATES) IV
- Pb at Exide: Rehrig in Vernon, and ATSF in City of Commerce
- Pb at Quemetco (Closet World) in City of Industry
- Pb at Trojan Battery (Uddelholm) in Santa Fe Springs

In addition, SCAQMD operates a network of air toxics stations, including National Air Toxics Trends Stations (NATTS) at the Los Angeles (Main) and Rubidoux sites. This audit addressed air toxics activities that support the NATTS, including both field and laboratory operations. These two sites are also designated as National Core (NCore) multi-pollutant monitoring sites.

SCAQMD operates a network of Photochemical Assessment Monitoring Stations (PAMS). The PAMS network consists of seven sites. LAX/Hastings is a Type 1 (upwind, background, and transport) PAMS site; Azusa, Burbank, Los Angeles (Main), and Pico Rivera are Type 2 (maximum precursor emission/central business district) sites; Rubidoux and Santa Clarita are Type 3 (maximum O<sub>3</sub> concentration) sites. EPA has approved the SCAQMD's PAMS network, operating schedule and forecasting scheme.

### **Field Operations**

Field operations are performed by the Atmospheric Measurements Division, which is managed by Jason Low. This division is divided into two work groups: Ambient Monitoring and Special Monitoring. Routine ambient monitoring is conducted by the Ambient Monitoring Group. The Special Monitoring Group undertakes special projects and seasonal monitoring as needed. The Ambient Monitoring Group is subdivided into Operations, Support, and Data Management sections. Day-to-day monitoring station operations are performed by the Operations section, which has sub-sections. Each sub-section has at least one Senior Air Quality Instrument Specialist (AQIS) and five AQISs. Repairs and calibrations are performed by AQISs in the Support section.

### **Laboratory Operations**

Analytical laboratories provide support for measurement methods that are either too complex or too sensitive to perform in the field. In order to provide these services, the laboratories has specialized instrumentation and employs staff specifically trained in their use..

For ambient air samples to provide useful information or evidence, laboratory analyses must meet the following basic requirements:

1. The laboratory must maintain a suitable facility for sample receipt, storage, analysis, and reduction and storage of data.
2. The laboratory must have sufficient and appropriate equipment that must be calibrated and maintained frequently.
3. The laboratory must have an adequate number of qualified staff.
4. Analytical procedures must be in accordance with official guidance, EPA methods and accepted practice.
5. Complete and accurate records must be kept.

SCAQMD has a clean, modern, expansive laboratory facility located at its headquarters office in Diamond Bar, California. The laboratory supports the many chemical analyses necessary to understand a large complex air basin and its diverse source mix. One of the primary responsibilities of the laboratory is the handling of PM filters, which includes preparation, weighing, tracking and storing of PM<sub>2.5</sub>, PM<sub>10</sub> and total suspended particle (TSP) filters. In addition to PM responsibilities, the laboratory is also responsible for the analyses of Speciation Trends Network (STN), PAMS, NATTS and special projects samples collected by SCAQMD, including samples collected for the Multiple Air Toxics Exposure Study (MATES) series. The compounds SCAQMD routinely analyzes for include:

- PAMS VOCs (SCAQMD SOP00007: "Standard Operating Procedure for TO-14")
- NATTS VOCs (SCAQMD SOP00008B: "Standard Operating Procedure for TO-15")

- PAMS and NATTS Carbonyls (SCAQMD SOP00006: “Determination of Carbonyl Compounds Using Waters 600E High Pressure Liquid Chromatograph and 996 Photodiode Array Detector”)
- STN PM<sub>2.5</sub> metals by X-ray Fluorescence (XRF) (SCAQMD SOP 00004: “Analysis of PM<sub>2.5</sub> Filter Samples by Energy dispersive X-Ray Fluorescence spectrometry”)
- NATTS PM<sub>10</sub> metals by Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS) (SCAQMD SOP 00005: “Determination of Metals in Ambient Particulate Matter by Inductively Coupled Plasma - Mass Spectrometry”)
- TSP-Pb by ICP-MS (SCAQMD SOP 00005: “Determination of Metals in Ambient Particulate Matter by Inductively Coupled Plasma - Mass Spectrometry”)
- NATTS Acrolein (SCAQMD SOP00008B: “Standard Operating Procedure for TO-15”)
- NATTS Hexavalent Chromium by ion chromatography (SCAQMD SOP 0046: “Analysis of Hexavalent Chromium in Ambient Air by Ion Chromatography”)
- STN PM<sub>2.5</sub> Anions (SCAQMD SOP 00003 “Analysis of PM<sub>2.5</sub> filters for Anions by Ion Chromatography”)

There are a number of additional activities the laboratory undertakes to support the collection and analysis of air pollutants. These include canister cleaning and preparation, data validation and sample storage.

#### Particulate Matter Laboratory (Gravimetric Laboratory)

SCAQMD possesses a PM dedicated humidity and temperature controlled gravimetric laboratory (weighing room) located south of the main laboratory. All filter conditioning and weighing takes place in this weighing room. Humidity and temperature for the room are computer controlled, accessed, control charted, and recorded during each weighing session. The temperature and relative humidity meet the requirements contained in the EPA Reference Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II, May 2013.

#### Toxicology Laboratory

SCAQMD toxics analyses, such as those performed in support of the NATTS Program, are conducted at the main agency laboratory. This approximate 20,000-square-foot laboratory has room ventilation meeting a minimum of six air changes per hour, with good air distribution and has a slightly negative (a minimum of 100 cubic feet per minute per door) relative to hallways and other non-laboratory areas. Toxics analyses are performed on six of 16 benches adjacent to three fume hoods within the main laboratory (two benches each for gas chromatography-mass spectrometry (GCMS), high performance liquid chromatography (HPLC), and gas chromatography-flame ionization detection (GCFID) analyses). In addition, a small room containing one PAMS canister cleaning and two NATTS canister cleaning ovens is accessed from the main laboratory.

#### Data and Data Management

Data management includes data collection, the data validation process, and a data management system. Data management at SCAQMD follows two separate tracks: one for continuous (i.e., non-laboratory) data and one for laboratory data.

SCAQMD has defined procedures for handling data from the time of acquisition to the time it is submitted to the EPA Air Quality System (AQS). The procedures are well known to the principal data providers and reviewers. Responsibility for managing ambient monitoring data is divided between the Atmospheric Measurements Branch operators, data validators, and Senior and Principal AQISs.

The Quality Assurance Manager records and documents activity associated with QA audits and evaluation results to a Quality Assurance Alert Log, AQS Event Flag Summary, and Corrective Action Request Log. These reports are incorporated into the review processes of Atmospheric Measurements and the Laboratory.

SCAQMD has four separate data management and validation processes in place for different data streams reported to AQS. Atmospheric Measurements handles continuous monitoring data while the laboratory conducts these processes using three data streams: 1) filter-based PM<sub>2.5</sub>; 2) filter-based PM<sub>10</sub>, TSP, Pb, and non-NAAQS metals; and 3) organic analyses.

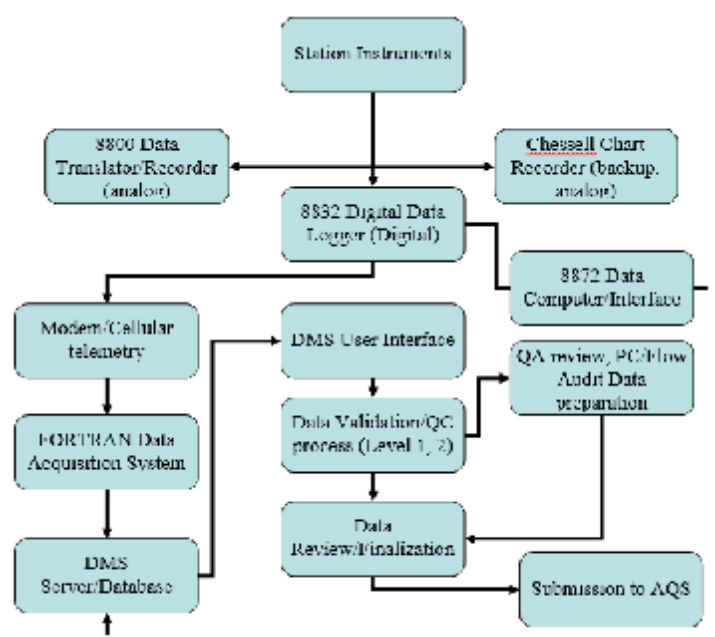


### Continuous Monitoring for Gaseous Pollutants and Particulates

Continuous analyzer air quality data collected at field stations are stored in SCAQMD data loggers and station computers. Each station is polled minute-by-minute and the data are transmitted to SCAQMD's central computer database. Electronic chart recorders (Eurotherm Chessels) located at each station serve as a back-up system and provide a supplemental record for data validation. Data may also be transferred manually using various devices, including laptop computers and flash drives.

SCAQMD performs four levels of validation for continuous data. The station data loggers and the FORTRAN-based data system perform automated checks. Also, FORTRAN automatically reviews data completeness and backfills any missing hourly data-points on a monthly basis. FORTRAN is an additional backup data source that can be used if the main data acquisition system (DAS) fails at any point. Field Operation staff review data and recommend flags. Data validators review quality control parameters. Data validators then evaluate data in relation to concurrent, corresponding data sets.

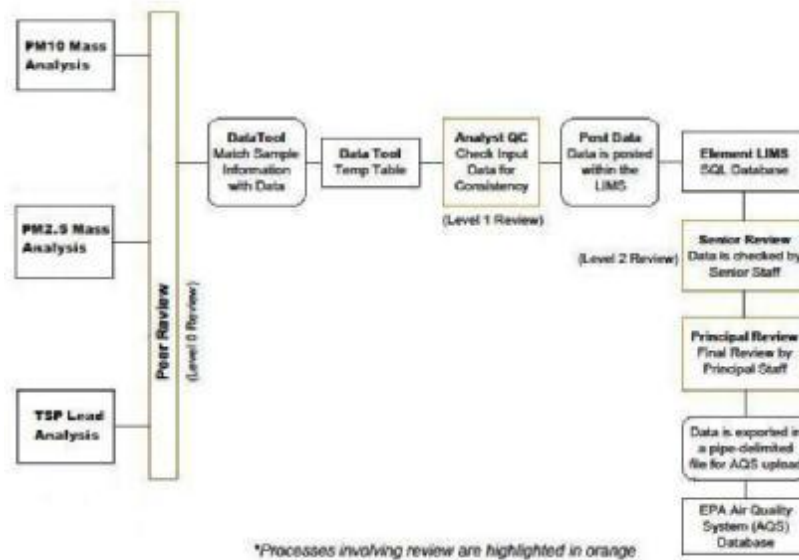
**Data Flow Diagram for continuous data:**



Laboratory Data Systems: Filter-Based PM<sub>2.5</sub> Particulate Monitoring; Monitoring of Lead and non-NAAQS Metals; and Monitoring of Organic Compounds

The laboratory uses a Promium Element® LIMS Data System, put in operation in January 2010. Data for each analyzed sample is exported into the LIMS database. Laboratory analytic data is combined with field data in the LIMS, where it is reviewed by a Senior AQ Chemist who also reviews chain of custody sheets, investigates and flags missing data, investigates and flags data outliers, flags data for exceptional events, and produces quarterly reports and a pipe delimited text document that is submitted to AQS. Sample information is recorded on sample logs, chain of custody sheets, sampler printouts, and sampler digital outputs and transferred to the laboratory LIMS database (SOP00108). The LIMS database also tracks prepared samples, samples deployed to the field, and samples returned and awaiting analysis. PM data is processed, verified and validated according to SOP00121.

**Data Flow Diagram for Filter-Based data:**



## **Quality Management**

Quality management is a system for overseeing quality assurance (QA), quality control (QC) and quality improvement activities. EPA requires that ambient air monitoring agencies receiving federal funding have a quality management system that conforms to 40 CFR 50 Appendix A and the EPA quality policy (EPA Order CIO 2105.0). Additionally, EPA grant regulations require each grantee to provide for QA activities (40 CFR 31.45). Specifically, 40 CFR 50 Appendix A, §3 requires that each ambient air monitoring Primary Quality Assurance Organization (PQAO) conforms to certain quality management practices including:

- A documented quality system that meets EPA requirements for Quality Management Plans (QMPs) and Quality Assurance Project Plans (QAPPs).
- A quality management function that is independent of air monitoring operations.
- Defined Data Quality Objectives (DQOs), or equivalent systematic planning procedures, for all monitoring programs.
- Participation in National Performance Evaluation Programs, which consist of performance audits used to independently determine program adequacy, national monitoring network performance, and national consistency.
- Participation in Technical Systems Audits by EPA at a frequency of at least once every three years.
- Use of certified reference materials to standardize monitoring equipment.

EPA views the application of these quality management system components as integral to satisfying federal monitoring program requirements. Insufficient quality management and control may undermine the ability of EPA to make NAAQS designation decisions due to data of insufficient or indeterminate quality for program needs.

SCAQMD has a well-defined quality management system that includes a quality management plan (QMP) and oversight by an independent quality assurance manager and robust audit program.

SCAQMD has a QA group (QA Branch) led by a QA Manager, Andrea Polidori, having organizational parity with the Ambient Monitoring and Laboratory Managers. Two staff members report directly to the QA Manager; a QA Senior AQ Instrument Specialist

responsible for field auditing and a QA Senior AQ Chemist responsible for laboratory QA activity as well as tracking of P&A documentation. The QA group also manages a support contract to perform additional QA/QC audits of the monitoring network.

EPA regulations require independent performance audits of gaseous pollutants and flow audits of PM<sub>2.5</sub> and PM<sub>10</sub> air samplers and monitors. For gaseous pollutants, regulation requires that 25% of each pollutant monitoring network be audited per calendar quarter, thus ensuring that each instrument is audited once per year. Prior to 2007, flow audits of these monitors were also required. Additionally, quarterly independent flow audits of PM<sub>2.5</sub> samplers were required. Beginning in calendar year 2007, semi-annual flow audits of each PM<sub>2.5</sub>, PM<sub>10</sub>, and TSP sampler were required (40 CFR, Part 58, Appendix A, Sections 3.2.4 and 3.3.3.). This is in addition to the required monthly flow evaluations as per 40 CFR, Part 58, Appendix A, Sections 3.2.3 and 3.3.2.

The Quality Assurance Branch is responsible for conducting required gaseous pollutant audits as well as PM<sub>10</sub> and PM<sub>2.5</sub> flow audits. An independent contractor performs flow audits of filter-based samplers and provides audit results to the QA Branch and site operators. This same contractor also performs meteorological audits.

FINDINGS

Program Area	Finding Numbers	EPA Contact
General	A1, A2, A3, A4, A5 (positive), A6 (positive)	A1, A2 – Gwen Yoshimura A3, A4 – Mathew Plate
Network Management	None	
Field Operations	C1, C2, C3	Mathew Plate
Laboratory Operations	D1, D2, D3	D1, D2 – Mathew Plate D3 – Gwen Yoshimura
Data and Data Management	E1 (EPA-directed)	Gwen Yoshimura
Quality Management	F1, F2	Mathew Plate

<b>Finding #</b>	A1
<b>Agency:</b>	SCAQMD
<b>Date of Audit:</b>	September 24-25, 2013
<b>Program Area:</b>	General
<b>Finding:</b>	
	SCAQMD is not evaluating or implementing potential short-term fixes for <u>some of the</u> existing siting issues.
<b>Description:</b>	
	During the TSA it was apparent that SCAQMD was aware of siting issues at some of their stations. Their auditors were not consistently documenting these issues, and while long-term solutions were contemplated, the data were not being flagged in the meantime. It is therefore unclear how SCAQMD’s planning group and other data users would know that the data may need to be qualified. South Long Beach and Pomona are two sites that are known to have problems.
<b>References:</b>	
	40 CFR part 58, appendix E
<b>Recommendation to Address Finding:</b>	
	<ol style="list-style-type: none"><li>1. Siting issues should be consistently documented, whether or not they have been documented in previous audits or if there is a plan in place to address them in the future.</li><li>2. The QA group should evaluate siting of each existing monitoring station, taking new measurements, and performing independent siting evaluations.</li><li>3. When siting issues arise, SCAQMD should:<ol style="list-style-type: none"><li>a) Determine how to address the issue</li><li>b) Document the siting issues in the annual network plan</li><li>c) Based on its extent, determine for which regulatory decisions the data should not be used, if any.</li><li>d) Determine how to address previously collected and currently collected data. Possible approaches might be to request a siting waiver from EPA, include a data qualifier code in AQS, or invalidate the data.</li><li>e) If there is a long-term solution, consider developing a contingency plan in case it is delayed or does not occur.</li></ol></li></ol>

**Commented [a2]:** It should probably be noted that that SCAQMD is in the process of consolidating stations affected by siting issues, as outlined in their 5-year network assessment document.

<b>Finding #</b>	A2
<b>Agency:</b>	SCAQMD
<b>Date of Audit:</b>	September 24-25, 2013
<b>Program Area:</b>	General
<b>Finding:</b>	
Staff turnover, unfilled positions and increased responsibilities may result in loss of data or compromised data quality.	
<b>Description:</b>	
<p>SCAQMD has very capable, knowledgeable management and staff. Recently, they have had a number of retirements and lost staff in critical positions. While the organization covers normal operations adequately, resources are not currently sufficient to manage additional needs (e.g., new projects, new requirements such as EPA Near Roadway monitoring, instrument repair, troubleshooting DMS, etc). Some examples were noted where the lack of additional staff might impact data quality: 1) SCAQMD is behind in submitting data to AQS; 2) an instance was found where data that did not automatically upload was not backfilled; 3) key staffing vacancies in the laboratory hindered process flow; 4) some data validation is not currently reviewed.</p> <p>SCAQMD recognizes this challenge and is addressing it by prioritizing the most critical positions to be filled. They also prioritize the order in which monitoring issues are addressed. While this is a logical and appropriate solution given the existing resource constraints, it should be noted that additional staff would allow SCAQMD to maintain normal functions as well as address new issues and requirements as they arise, instead of having to choose which resources to allocate where and deferring or not addressing some program elements. SCAQMD could also consider evaluating whether adjustments to the air monitoring program, such as site consolidation, would help align current workload with available resources.</p>	
<b>References:</b>	
<p>EPA Requirements for Quality Management Plans, EPA QA/R-2, EPA/240/B-01/002, March 2001, Section 3.2</p> <p>SCAQMD Quality Management Plan for Environmental Measurement Program, January 2009, Section 3.2</p> <p>40 CFR part 58.16 Data submittal and archiving requirements.</p>	
<b>Recommendation to Address Finding:</b>	
<ol style="list-style-type: none"><li>1. Fill key positions and obtain more resources when possible.</li><li>2. SCAQMD should evaluate whether there are options to improve efficiency and/or reduce workload. For example, low priority or redundant sites/monitors could be closed or sampling schedules adjusted to reduce the resource burden.</li></ol>	

**Commented [a3]:** It should probably be noted that efforts have been underway to address this problem. Three Senior Chemist positions have recently been approved and critical vacancies in the Air Monitoring (AM) group will be filled in 2014. In particular, the AM Operations and Calibrations groups are the in process of recruiting one AQIS I position and one AQIS II position, respectively.

<b>Finding #</b>	A3
<b>Agency:</b>	SCAQMD
<b>Date of Audit:</b>	September 24-25, 2013
<b>Program Area:</b>	General
<b>Finding:</b>	
	SCAQMD does not have an approved QAPP for PAMS monitoring.
<b>Description:</b>	
	<p>All required QAPPs have been submitted by SCAQMD except PAMS (2010 TSA finding A1). All environmental measurements funded by EPA require an approved QAPP. Because EPA has been working with state and local agencies to “reinvent” the PAMS program over the last several years, SCAQMD has been hesitant to develop a PAMS QAPP. However, SCAQMD has very specific programmatic needs for PAMS data, consequently, a District-specific program and QAPP that addresses data needs and anticipates programmatic changes would be appropriate.</p> <p>The data quality objectives developed in the QAPP should dictate the level of quality control needed, especially where there are deviations from the PAMS Technical Assistance Document (TAD). (2010 TSA finding D3)</p>
<b>References:</b>	
	<p>“Technical Assistance Document for Sampling and Analysis of Ozone Precursors”, EPA/600-R-98/161, September 1998</p> <p>40 CFR parts 31 and 35</p> <p>40 CFR 58, appendix A, §2.1.</p> <p>“EPA Requirements for Quality Management Plans (QA/R-2)”, EPA/240/B-01/002, March 2001.</p> <p>“EPA Requirements for QA Project Plans (QA/R-5)”, EPA/240/B-01/003, March 2001</p>
<b>Recommendation to Address Finding:</b>	
	SCAQMD should develop a PAMS program, objectives, and a QAPP to meet the organization’s needs.

**Commented [a4]:** Since EPA is still in the process of revamping the PAMS program, we would prefer waiting for more specific directions before finalizing our existing PAMS QAPP Draft. This would allow us to focus on solving QA-related issues that require more immediate attention.

This finding should probably be modified to reflect these comments.

**Commented [a5]:** Please note that:

1-Specific programmatic needs for the PAMS data have been discussed internally by SCAQMD Staff

2-We already have a solid PAMS QAPP Draft that can be easily updated once more specific directions from EPA become available

<b>Finding #</b>	A4
<b>Agency:</b>	SCAQMD
<b>Date of Audit:</b>	September 24-25, 2013
<b>Program Area:</b>	General
<b>Finding:</b>	
Documentation procedures for logbooks and forms should be improved.	
<b>Description:</b>	
<p>SCAQMD does a relatively good job of documenting data collection activities. Several discrepancies were noted during the audit that should be improved.</p> <p>Most significantly:</p> <ul style="list-style-type: none"><li>• Signatures/initials and dates do not always accompany entries or changes to documents. Sometimes this is the result of forms used over a period of time (i.e., weekly) that do not have sufficient blocks for signature/initials and/or dates.</li></ul> <p>EPA also noted:</p> <ul style="list-style-type: none"><li>• Incorrect calibration documentation</li><li>• Forms / Logbooks with no documented management or peer review</li><li>• Station logbooks not transmitted to data review/validation staff on a regular basis</li></ul>	
<b>References:</b>	
<p>QA Handbook for Air Pollution Measurement Systems, Volume II, EPA-454/B-13-003, May, 2013, Section 6</p> <p>EPA’s APTI Course 444, <i>Air Pollution Enforcement Student Manual</i>, Chapter 8</p>	
<b>Recommendation to Address Finding:</b>	
<ol style="list-style-type: none"><li>1. Evaluate and revise documentation procedures with the goal of eventually moving to electronic documentation that is traceable and available to operations, calibration, data review, and quality assurance staff and management.</li><li>2. Include documentation as a part of routine training programs.</li><li>3. Ensure all documentation is routinely reviewed by a second staff person or manager for accuracy.</li></ol>	




<b>Finding #</b>	A5
<b>Agency:</b>	SCAQMD
<b>Date of Audit:</b>	September 24-25, 2013
<b>Program Area:</b>	General
<b>Positive Finding:</b>	
	Communication between the laboratory, quality assurance (QA), ambient monitoring, and management levels has improved since the last TSA.
<b>Description:</b>	
	<p>Past TSAs have noted disconnects between operations and support, QA and the laboratory. SCAQMD now holds <a href="#">weekly regular</a> meetings between the three <del>managers</del><a href="#">principals</a> (Jason Low, Andrea Polidori, and Rudy Eden), as well as monthly meetings with staff. <a href="#">Furthermore, managers and principals meet on a weekly basis to discuss about impending issues.</a></p> <p>As an example of the effective communication that is now in place, <a href="#">w</a>hen a new instrument is brought in, a task force made up of representatives from operations, support, and others who are involved with the operations and maintenance of the instrument is convened. Involving those who need to use and understand the SOP from the beginning makes it more useful for its target audience and ensures that members of the respective groups know the changes and details.</p>
<b>References:</b>	
<b>Recommendation to Address Finding:</b>	
	N/A

<b>Finding #</b>	A6
<b>Agency:</b>	SCAQMD
<b>Date of Audit:</b>	September 24-25, 2013
<b>Program Area:</b>	General
<b>Positive Finding:</b>	
Staff and management are extremely knowledgeable and are working to proactively implement improvements, as well as effectively troubleshooting issues as they arise, as time allows.	
<b>Description:</b>	
SCAQMD has been going through a number of transitions with staff and management changes, as well as changes to their data systems. There is also a very high workload. SCAQMD has been working collaboratively across groups to discuss issues, prioritize workload, and identify ways to improve or increase efficiency. EPA was impressed with the general knowledge and understanding of the monitoring system as a whole, and the ability for this high-functioning group to keep things running despite staffing and technological challenges. Several staff and managers have been cross-trained or have experience in other branches, which lends additional strength to the overall program.	
<b>References:</b>	
<b>Recommendation to Address Finding:</b>	
N/A	

<b>Finding #</b>	C1
<b>Agency:</b>	SCAQMD
<b>Date of Audit:</b>	September 24-25, 2013
<b>Program Area:</b>	Field
<b>Finding:</b>	
There is insufficient room at many monitoring sites for EPA PM <sub>2.5</sub> and Pb PEP audit samplers.	
<b>Description:</b>	
<p>EPA is required to perform collocated sample collection at all PM<sub>2.5</sub> and Pb TSP monitors that might be used for regulatory decisions. Collocated PEP samplers must be within four meters of each other horizontally and at least one meter apart for low flow instruments or at least two meters apart for high flow instruments, to preclude airflow interference. Also, it is a general practice for the vertical distance between the PE sampler inlet and the audited site sampler inlet to be ≤1 meter.</p> <p>In current site configurations, there may be insufficient room for EPA PM<sub>2.5</sub> PEP or Pb PEP audit samplers to meet these general requirements.</p> <p>Note that the EPA contractor has been setting up the NPEP audit samplers in the space available at the stations, however, in many cases the collocation siting is not ideal.</p>	
<b>References:</b>	
<p>40 CFR 58, appendix A, §3.2.7, 3.3.1.2 and 3.3.4.4</p> <p>“Quality Assurance Project Plan for the Federal PM<sub>2.5</sub> Performance Evaluation Program”, March 2009</p> <p>Field Standard Operating Procedures for the Federal PM<sub>2.5</sub> Performance Evaluation Program, 2009</p>	
<b>Recommendation to Address Finding:</b>	
Provide appropriate accommodation for EPA PM <sub>2.5</sub> and Pb PEP audit samplers.	

**Commented [a6]:** It would be helpful if you could provide more details about specific sites that may lack room for audit samplers. Space at most of our audit stations (e.g. Rubidoux and Los Angeles) is often limited by specific conditions established in the lease, and it is highly impacted by the demanding monitoring programs requirements and the need to share some of this space with Universities and other research organizations. However, annual audits have never been compromised due to lack of space.

This finding should probably be modified to reflect these comments.

<b>Finding #</b>	C2
<b>Agency:</b>	SCAQMD
<b>Date of Audit:</b>	September 24-25, 2013
<b>Program Area:</b>	Field
<b>Finding:</b>	
The South Long Beach site has several siting issues.	
<b>Description:</b>	
<p>The South Long Beach monitoring site is located on a border strip in a community college parking lot. There are TSP, PM<sub>10</sub> (high volume), PM<sub>2.5</sub> FRM, PM<sub>2.5</sub> BAM and meteorological monitors at this site. The site was visited on a Tuesday afternoon while the college was in session. The parking lot was full and extremely busy. The monitoring site is located near one of the main entrances to the parking lot. There is also a tree several meters east of the monitoring site (6.4 meters from the closest monitor (PM<sub>2.5</sub> BAM)).</p>	
	

On the day of the visit, EPA observed parking spaces adjacent to the information from an aerial photograph, consistently adjacent to the monitors site. The nearest parking space was the inlet of the PM<sub>2.5</sub> BAM.

The condition of the metal mesh at platforms was quite rusted and particularly noticeable on the platform. This is a potential safety hazard. Wind caused the PM<sub>10</sub> sampler to vibration/movement may impact



a storage container in the four monitors. Based on this container has not been and cars park adjacent to the less than three meters from

several of the sampling unstable. This was used for the PM<sub>10</sub> sampler. Additionally, a moderate oscillate strongly. This proper sampler operations.

**References:**

40 CFR 58, appendix E

**Recommendation to Address Finding:**

1. Ensure compliance with distance from trees and obstructions siting requirements.
2. If this site is still operating when SCAQMD develops its 2015 Network Assessment, address scale of representation in the assessment.
3. Evaluate the platforms being used in the monitoring network and replace or re-enforce the platforms as needed.

<b>Finding #</b>	C3
<b>Agency:</b>	SCAQMD
<b>Date of Audit:</b>	September 24-25, 2013
<b>Program Area:</b>	Field
<b>Finding:</b>	
Field blanks for TSP Pb are not routinely performed for all monitoring sites.	
<b>Description:</b>	
Blanks controls are essential to demonstrate that contamination has not been introduced into sampling process.  The QA Handbook Volume II recommends that one field blank be collected quarterly for each instrument.	
<b>References:</b>	
<i>QA Handbook for Air Pollution Measurement Systems</i> , Volume II, EPA-454/B-13-003, May, 2013	
<b>Recommendation to Address Finding:</b>	
Implement field blank collection for TSP Pb on at least a quarterly basis for each instrument.	

<b>Finding #</b>	D1
<b>Agency:</b>	SCAQMD
<b>Date of Audit:</b>	September 24-25, 2013
<b>Program Area:</b>	Laboratory
<b>Finding:</b>	
The microwave digestion vessels are not being labeled, which creates the potential to confuse samples during the Pb filter preparation process.	
<b>Description:</b>	
The microwave digestion vessels are not being labeled and are moved between the microwave digestion rack and a test tube rack to prepare and remove sample aliquots. This process introduces the potential that samples may be confused and subsequently misreported at some frequency. Additionally, there is no way to track which samples may have been impacted by a contaminated or defective extraction vessel. The analyst stated that the Teflon vessels are not intended to be labeled. However, these vessels could be permanently marked and tracked.	
<b>References:</b>	
QA Handbook for Air Pollution Measurement Systems, Volume II, EPA-454/B-13-003, May, 2013, Section 8.1.1  Pb Equivalent Method EQL-0710-182, Section 8.3.1 Filter Handling Procedure	
<b>Recommendation to Address Finding:</b>	
Utilize microwave extraction vessels that are marked and tracked in the extraction process.	

<b>Finding #</b>	D2
<b>Agency:</b>	SCAQMD
<b>Date of Audit:</b>	September 24-25, 2013
<b>Program Area:</b>	Laboratory
<b>Finding:</b>	
Raw electronic laboratory data are not consistently organized and indexed to allow them to be easily recalled from the data storage system.	
<b>Description:</b>	
2010 SCAQMD finding A2 noted significant issues with electronic record storage by the laboratory. The SCAQMD laboratory has centralized, secured and backed up records, including instrument data files, to respond to this concern. In order to complete this process, the laboratory should ensure that all instrument-generated records and related metadata are consistently organized and indexed so that they can be recalled and reanalyzed as needed by staff other than the primary analyst. Currently, data is not consistently accessible for reanalysis and validation by laboratory staff and quality assurance staff, without assistance by the primary analyst.	
<b>References:</b>	
Basic Requirements of an Electronic Recordkeeping System at EPA, <a href="http://www.epa.gov/records/tools/erks.htm">http://www.epa.gov/records/tools/erks.htm</a>	
<b>Recommendation to Address Finding:</b>	
Develop and follow a procedure for indexing electronic laboratory instrument records so that individuals other than the primary analyst may have access to this data.	



<b>Finding #</b>	D3
<b>Agency:</b>	SCAQMD
<b>Date of Audit:</b>	September 24-25, 2013
<b>Program Area:</b>	Laboratory
<b>Finding:</b>	
	Some Pb-TSP filters and the associated official Chain of Custody forms could not be located.
<b>Description:</b>	
	<p>During data tracking, EPA reviewed data from a number of Pb-TSP filters. While some were easily located in LIMS and the actual Pb-TSP filter in the envelope (the envelope is the COC and provides validation information) were quickly found, SCAQMD was unable to locate two filters. The technician explained that these missing filters were recently sent out to a researcher, but was not able to verify this during the audit.</p> <p>The filters and the information contained on the filter envelopes should be consistently organized, indexed, and tracked.</p>
<b>References:</b>	
	<p>QA Handbook for Air Pollution Measurement Systems, Volume II, EPA-454/B-13-003, May, 2013, Section 6</p> <p>EPA’s APTI Course 444, <i>Air Pollution Enforcement Student Manual</i>, Chapter 8</p>
<b>Recommendation to Address Finding:</b>	
	<ol style="list-style-type: none"><li>1. Develop the laboratory records management system to include tracking of the Pb-TSP filters post analysis.</li><li>2. Do not remove the official documentation from the original filter envelope and send it to an outside entity. If the filters are sent offsite, prepare a second envelope and retain the original, as it constitutes official documentation. See finding A4.</li></ol>

**Commented [a7]:** We may want to indicate that these particular filters and the corresponding chain of custody forms were sent to EPA Region IX for the Pb PEP program.

<b>Finding #</b>	E1
<b>Agency:</b>	SCAQMD
<b>Date of Audit:</b>	September 24-25, 2013
<b>Program Area:</b>	Data Management
<b>EPA-Directed Finding:</b>	
SCAQMD requested guidance and/or training on how to apply AQS codes to data.	
<b>Description:</b>	
Previously, DMS only allowed four flags to be entered. It now allows multiple flags. SCAQMD has found that some flags cannot be applied to certain parameters (for example, AQS would not accept the flag “SX – does not meet siting criteria” for gaseous parameters at the West Lost Angeles site, August 2012 – October 2012). SCAQMD has requested that EPA provide flagging guidance or training.	
<b>References:</b>	
<b>Recommendation to Address Finding:</b>	
EPA will investigate what trainings or guidance currently exist, and work to develop additional materials if those are insufficient.	

<b>Finding #</b>	F1
<b>Agency:</b>	SCAQMD
<b>Date of Audit:</b>	September 24-25, 2013
<b>Program Area:</b>	QA/QC
<b>Finding:</b>	
The QA program does not provide consistent oversight of all data-related activities of the organization.	
<b>Description:</b>	
<p>Finding A4 and general deficiencies from the 2010 TSA highlighted the need to strengthen the quality management function of the Quality Assurance Branch.</p> <p>In the last three years, the SCAQMD QA program has submitted critical planning documents (QAPPs/SOPs) to EPA, strengthened the audit program, implemented corrective actions, and supported the data certification process. The program should continue to develop and implement a comprehensive and consistent quality management process for the organization.</p> <p>It was noted during the audit that:</p> <ul style="list-style-type: none"><li>• Apart from the data certification process, the QA program does not employ tools, such as control charts, to track data quality trends.</li><li>• Internal technical systems audits and audits of data quality are not performed on a routine basis.</li><li>• Field evaluations of monitoring stations do not identify siting and other on-going issues that may compromise the representativeness of data. Where these deficiencies exist, the QA program should evaluate impacts on data quality and vulnerabilities to data defensibility.</li><li>• Monitoring staff should have additional QA training so that they fully understand the relationship of their work to the quality assurance process.</li><li>• The QA program should balance its role in the laboratory that includes both technical support and independent QA oversight of laboratory activities. This may require that QA program staff take on different responsibilities with respect to the laboratory to promote engagement with and independence from the laboratory.</li></ul> <p>In sum, the QA program must provide sufficient oversight in order to effectively evaluate the quality of the organization’s data collection activities in relation to identified data objectives.</p>	
<b>References:</b>	
40 CFR 58, appendix A, §2.2 Independence of Quality Assurance	
<b>Recommendation to Address Finding:</b>	
Develop a strategy to improve documentation and understanding of the quality of the District’s monitoring data, and to strengthen quality management and oversight.	

**Commented [a8]:** We agree that the quality management function of QA should be strengthened. However, in order to assess data quality QA Staff generates and reviews multiple AQS reports, control chart in DMS, and other diagnostic summary reports periodically. Following this data review process, corrective actions are taken accordingly.

<b>Finding #</b>	F2
<b>Agency:</b>	SCAQMD
<b>Date of Audit:</b>	September 24-25, 2013
<b>Program Area:</b>	QA/QC
<b>Finding:</b>	
	There is currently no formal process for implementing and updating SOPs.
<b>Description:</b>	
	<p>SCAQMD has completed work on SOPs that cover most of the ambient air monitoring tasks/methods performed.</p> <p>Several SOPs were also being updated or developed at the time of the audit. SCAQMD QA is working with the monitoring and laboratory groups to plan, write, finalize, and implement these new procedures. The process that identifies the need for a new SOP or a significant procedural update and the SOP development procedures should be formalized by the QA group.</p> <p>SCAQMD SOP0100 notes that SOPs will be reviewed every two years. The QA group should work with monitoring group and the laboratory to develop a specific schedule for review and updating of SOPs.</p>
<b>References:</b>	
	<p>Guidance for Preparing Standard Operating Procedures, EPA QA/G-6, EPA/600/B-07/001, April 2007, Section 2.0 SOP Process</p> <p>SCAQMD, SOP0100, Guidance for Preparing SOPs</p>
<b>Recommendation to Address Finding:</b>	
	Develop a schedule and procedure for reviewing and updating SOPs.

**Commented [a9]:** Please note that QA Staff has been keeping track of relevant information regarding all existing SOPs (e.g. version #, revision date, etc.) on an Excel database that is updated regularly. The QA Office has been informing Field and Laboratory Staff about the need to update and implement critical SOPs.

This finding should probably be modified to reflect these comments.

**APPENDIX A: SUMMARY OF FINDINGS**

**Commented [a10]:** This part should reflect the final changes in the main “FINDINGS” section

**FINDINGS**

(does not include Positive Findings or EPA-Directed Findings)

**General Finding A1:** SCAQMD is not evaluating or implementing potential short-term fixes for existing siting issues.

**General Finding A2:** Staff turnover, unfilled positions and increased responsibilities may result in loss of data or compromised data quality.

**General Finding A3:** SCAQMD does not have an approved QAPP for PAMS monitoring.

**General Finding A4:** Documentation procedures for logbooks and forms should be improved.

**Field Operations Finding C1:** There is insufficient room at many monitoring sites for EPA PM<sub>2.5</sub> and Pb PEP audit samplers.

**Field Operations Finding C2:** The South Long Beach site has several siting issues.

**Field Operations Finding C3:** Field blanks for TSP Pb are not routinely performed for all monitoring sites.

**Laboratory Operations Finding D1:** The microwave digestion vessels are not being labeled, which creates the potential to confuse samples during the Pb filter preparation process.

**Laboratory Operations Finding D2:** Raw electronic laboratory data are not consistently organized and indexed to allow them to be easily recalled from the data storage system.

**Laboratory Operations Finding D3:** Some Pb-TSP filters and the associated official Chain of Custody forms could not be located.

**Quality Management Finding F1:** The QA program does not provide consistent oversight of all data-related activities of the organization.

**Quality Management Finding F2:** There is currently no formal process for implementing and updating SOPs.

**APPENDIX B: GOOD PRACTICE RECOMMENDATIONS**

**GENERAL RECOMMENDATION 1:**

SCAQMD station operators and auditors do not receive siting training. As EPA has emphasized the importance of meeting siting requirements, SCAQMD has requested guidance or training to better equip their staff to recognize when something is an issue, as the regulations are often difficult to interpret. EPA recommends SCAQMD attend ARB siting training. If none is immediately available, SCAQMD should work with ARB and/or EPA to set up training opportunities.

**APPENDIX C: ORGANIZATIONAL CHART**



## South Coast Air Quality Management District

### Science & Technology Advancement

Monitoring & Analysis

Atmospheric Measurements/Quality Assurance

**Matt Miyasato 3249**  
Deputy Executive Officer

**Philip Fine 2239**  
Assistant Deputy Executive Officer (1135)

**Laurie Diton 2256**  
Sr Admin Secretary (0773)

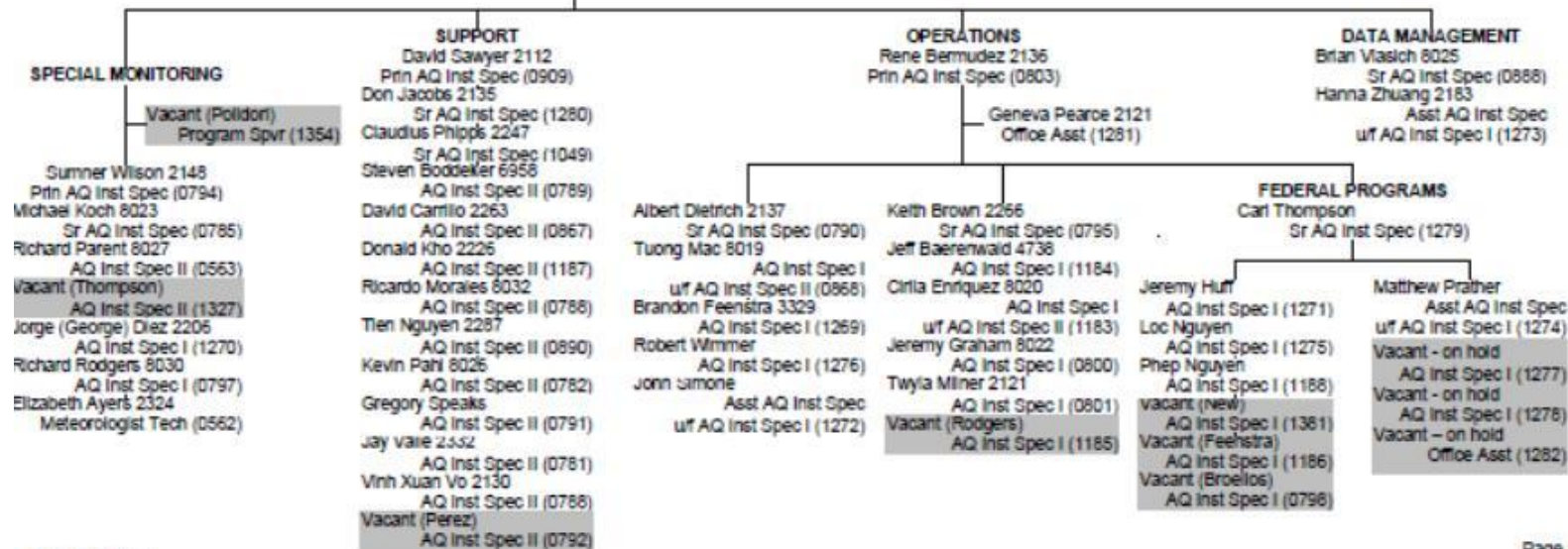
**ATMOSPHERIC MEASUREMENTS**  
Jason Low 2269  
Atmospheric Measurements Manager (0860)

**QUALITY ASSURANCE\***  
Andrea Polidori 3283  
Quality Assurance Manager (1319)

**Connie Ventura 2162**  
Secretary (0618)

**Raul Dominguez 2225**  
Sr AQ Chemist (0831)  
Vacant (New)  
Staff Specialist (1382)

**Michael Hamdan 8040**  
Sr AQ Inst Spec (0793)  
\*works with Atmospheric Measurements,  
Lab & Source Test staff



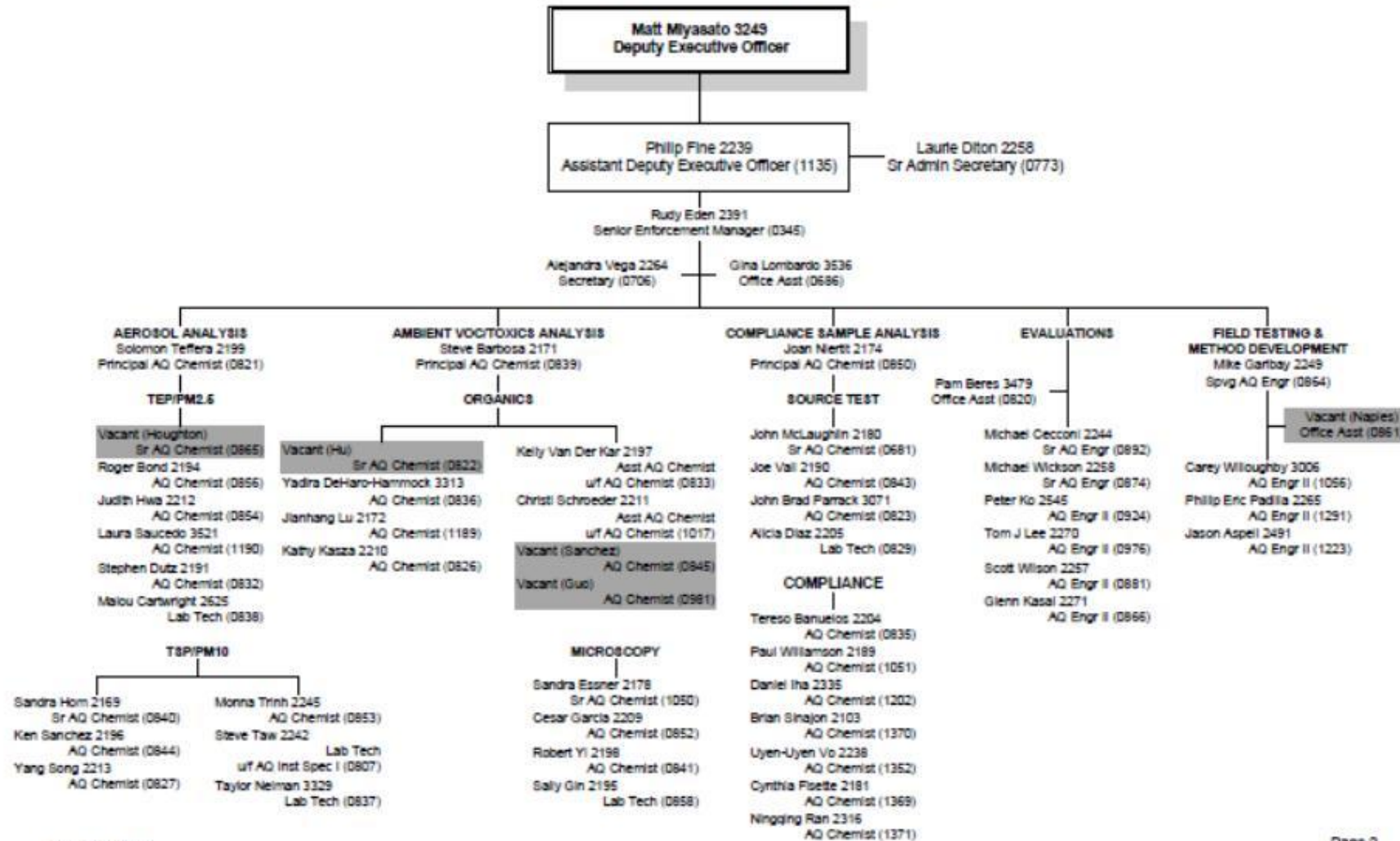




## South Coast Air Quality Management District

### Science & Technology Advancement

Monitoring & Analysis  
Laboratory Services – Source Test Engineering



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